

11/30/17 "Genius is 1% inspiration and 99% perspiration" -Thomas Edison

HW: "Adding & Subtracting Rational Expressions" w/s

AIM: How do we Add/Subtract Rational Expressions?

Warm Up:

$$1) \frac{\overset{(2)}{\cancel{2}} 5}{\overset{(2)}{\cancel{2}} 19} + \frac{7}{\underset{(2)(19)}{38}}$$

$$\frac{10}{38} + \frac{7}{38} = \frac{17}{38}$$

$$2) \frac{2}{15} - \frac{3}{25}$$

$$\frac{\overset{(5)}{\cancel{5}} 2}{\overset{(5)}{\cancel{5}} 3 \cdot 5} - \frac{3}{5 \cdot 5} \frac{\overset{(3)}{\cancel{3}}}{\overset{(3)}{\cancel{3}}}$$

$$\frac{10}{75} - \frac{9}{75} = \frac{1}{75}$$

LCD: All factors of denominators are there

$$\begin{array}{l} \text{LCD:} \\ 3 \cdot 5 \cdot 5 \\ 75 \end{array}$$

$$\frac{7}{8} \neq \frac{17}{18} = \frac{7+10}{8+10}$$

**The Basic RULE for Adding and Subtracting Fractions:**

**Get a Common Denominator!**

Steps for Adding/Subtracting Rational Expressions:

1) *Factor First*

2) *Get a common denominator*

3) *Add | Subtract Numerator (Denominator stays same)*

4) *Simplify if possible*

Combine and simplify each of the following:

$$1\frac{7}{7} \cdot \frac{3}{4} + \frac{2}{7} \cdot \frac{4}{4}$$

$$\frac{21}{28} + \frac{8}{28}$$

$$\frac{29}{28}$$

$$\frac{(x+3) \cdot 6}{(x+3)x} - \frac{7(x)}{(x+3)(x)} \quad \text{LCD: } x(x+3)$$

$$\frac{6x+18}{x(x+3)} - \frac{7x}{x(x+3)}$$

$$\frac{-1x+18}{x(x+3)}$$

$$\frac{-1(x-18)}{x(x+3)}$$

$$\frac{y}{y} \cdot \frac{6}{x} + \frac{7}{xy} \quad \text{LCD: } xy$$

$$\frac{6y}{xy} + \frac{7}{xy}$$

$$\frac{6y+7}{xy}$$

$$\left(\frac{2}{2}\right) \frac{2x+3}{6x} - \frac{x-2}{4x} \left(\frac{3}{3}\right) \quad \text{LCD: } 12x$$

$$\frac{3+12}{12(3)} = \frac{15}{36}$$

$$\frac{4x+6}{12x} + \frac{-3x+6}{12x} = \boxed{\frac{x+12}{12x}}$$

$$\left(\frac{x}{x}\right) \frac{3}{x+2} + \frac{x-2}{x} \left(\frac{x+2}{x+2}\right) \quad \text{LCD: } x(x+2)$$

$$\begin{aligned} (x-2)(x+2) \\ x^2 - 2x + 2x - 4 \\ x^2 - 4 \end{aligned}$$

$$\frac{3x}{x(x+2)} + \frac{x^2-4}{x(x+2)} = \frac{3x+x^2-4}{x(x+2)}$$

$$= \frac{x^2+3x-4}{x(x+2)} = \boxed{\frac{(x+4)(x-1)}{x(x+2)}}$$

$$6. \frac{6}{y-5} - \frac{y+5}{y^2-25} = \frac{6}{y-5} - \frac{y+5}{(y-5)(y+5)} = \frac{6}{y-5} - \frac{1}{y-5} = \boxed{\frac{5}{y-5}}$$

$$\frac{(y+5)6}{(y+5)(y-5)} - \frac{y+5}{(y-5)(y+5)} \quad \text{LCD: } (y-5)(y+5)$$

$$\frac{6y+30}{(y-5)(y+5)} + \frac{-y+5}{(y-5)(y+5)} = \frac{5y+25}{(y-5)(y+5)} = \frac{5(y+5)}{(y-5)(y+5)} = \boxed{\frac{5}{y-5}}$$

$$7. \frac{2}{a^2-4} - \frac{1}{a^2+2a} = \frac{a}{a(a-2)(a+2)} - \frac{1(a-2)}{a(a+2)(a-2)} \quad \text{LCD: } a(a-2)(a+2)$$

$$\frac{2a}{a(a-2)(a+2)} - \frac{a-2}{a(a-2)(a+2)} = \frac{\cancel{a+2}}{a\cancel{(a+2)}(a-2)} = \boxed{\frac{1}{a(a-2)}}$$

$$8. \frac{1}{2-x} + \frac{2}{x-2}$$

$$\frac{-1}{x-2} + \frac{2}{x-2}$$

#9, 11, 13, 15

$$\frac{1}{x-2}$$

$$9. \frac{y}{y-3} - \frac{18}{y^2-9}$$

$$2-x = -1 \underset{x+(-2)}{(-2+x)} = -1(x-2)$$

$$-\frac{1}{2} = \frac{1}{-2}$$

$$10. \frac{2}{a+1} + \frac{3}{a^2-1}$$

$$11. \frac{2}{5a} + \frac{1}{4a}$$

$$12. \frac{1}{2a+2} + \frac{1}{a^2-1}$$



$$13. \frac{3}{x-3} + \frac{x}{3-x}$$

$$14. \frac{b}{b-1} - \frac{1}{2-2b}$$

$$15. \frac{1}{a+2} + \frac{a}{a^2+2} + \frac{a}{a+1}$$